

## RESEARCH PROJECTS RELATED TO THE POLYGRAPH

### I. Research on Psychophysiological Measurements of Stress

- A. A university group of psychiatrists, physiologists, and psychologists are investigating the validity of physiological measurements currently being used in the polygraph, are investigating other psychophysiological measurements which might be added to the polygraph, are investigating the physiological responses as they compare with psychological tests of the individuals, are investigating the significance of the state of consciousness of the individual under polygraph interrogation, and are investigating on-line analyses of certain types of physiological patterns.
- B. Another university group is investigating the electroencephalographic patterns of individuals under stress (astronauts and freeway drivers) to see whether the brain wave patterns indicate significant patterns related to stress. They are also investigating sophisticated statistical analyses of EEG data. If their investigations are successful, we will probably add the EEG to the polygraph system.
- C. An industrial laboratory is investigating the flow rate and content of parotid fluid to determine whether this will provide a biochemical measure of response to stress. If changes in flow rate are rapid enough, this may also provide an additional channel of information for polygraph use. The technique is relatively simple and not painful.

### II. Data Acquisition and Processing

- A. A large contract has been let with a major biomedical instrumentation corporation to instrument our polygraph interrogation rooms in such a way that we can accrue real standardized data in a form which will permit validation and reliability studies to be undertaken in the future. The data acquisition and conversion system is designed so that it does not in any way modify current procedures. It is flexible so that other measuring techniques can be added to the system if they should prove to be useful on the basis of studies listed under I above.

### III. Analysis

- A. A sub-contract to II has been negotiated with an industrial group who has been doing advanced research on pattern recognition. These individuals will subject our data to pattern recognition analysis to see whether this method of computer analysis will provide increased reliability and validity, thereby augmenting the polygraph operator.
- B. Certain aspects of I-A and I-B also involve computer analysis of the data. However, they are investigating statistical analyses of a more conventional type rather than using pattern recognition approaches.